## CLAIMS

1. A process for producing trehalose in plant cells capable of producing trehalase by growing plant cells having the genetic information required for the production of trehalose and trehalase, or cultivating a plant or a part thereof comprising such plant cells, characterised in that said plant cells are grown, or said plant or a part thereof, is cultivated in the presence of a trehalase inhibitor.

2. A process according to claim 1, wherein said plant cells have been genetically altered so as to contain a gene coding for a bipartite trehalose synthesizing enzyme in a plant expressible form.

3. A process according to claim 1, wherein said plant cells have been genetically altered so as to contain a chimeric trehalose phosphate synthase gene in a plant expressible form, preferably wherein the trehalose phosphate synthase gene comprises an open reading frame encoding trehalose phosphate synthase from *E. coli* in plant expressible form, more preferably wherein the open reading frame encoding trehalose phosphate synthase from *E. coli* is downstream of the CaMV 35S RNA promoter or the potato patatin promoter.

4. A process according ~~any of~~ claim 1 ~~to 3~~, wherein a *Solanum tuberosum* plant is cultivated, preferably wherein said plant has micro-tubers.

5. A process according to claim 4, wherein said plant is cultivated *in vitro*.

6. A process according to ~~any one of~~ claims 1 ~~to 5~~, wherein said trehalase inhibitor comprises validamycin A in a form suitable for uptake by said plant cells, said plant, or a part thereof~~, preferably wherein the concentration of validamycin A is between 100 nM and 10 mM, more preferably between 0.1 and 1 mM, in aqueous solution.~~

7. A process according to ~~any one of~~ claims 1 ~~to 5~~, wherein said trehalase inhibitor comprises ~~the~~ 86kD protein of the cockroach (*Periplaneta americana*) in a form suitable for uptake by said plant cells, said plant, or a part thereof.

8. A process according to ~~any one of~~ claims 1 ~~to 5~~, wherein said plant cells have been genetically altered to contain the genetic information for a trehalase inhibitor, ~~preferably wherein the trehalase inhibitor is the antisense gene to the gene encoding the information for trehalase or wherein the trehalase inhibitor is the 86kD protein of the American cockroach (*Periplaneta americana*).~~

9. A process according to ~~any one of~~ claims 1 ~~to 8~~, wherein a plant, or a part thereof, accumulates trehalose in an amount greater than ~~above~~ 0.01 % (fresh weight).

10. A plant, or a part thereof, or plant cells, obtainable by a process according to ~~any one of the~~ claims 1 ~~to 9~~, which contain trehalose in an amount above 0.01% (fresh weight), preferably wherein said plant, or a part thereof is a *Solanaceae* species, more preferably *Solanum tuberosum* or *Nicotiana tabacum*.

11. A plant part according to claim 10, which is a tuber or a micro-tuber.

12. Tuber or micro-tubers of *Solanum tuberosum* containing trehalose.

13. Use of a plant, or plant part, according to claim 10 for extracting trehalose.

14. Use of a plant, or plant part, according to claim 10 in a process of forced extraction of water from said plant or plant part.

15. A plant according to claim 10, which has an increased stress tolerance, ~~preferably increased drought tolerance~~.

16. A chimaeric plant expressible gene comprising in s quence a transcription initiation region obtainable from a gene, preferentially expressed in a plant part, particularly the patatin gene from *Solanum tuberosum*, a 5'-untranslated leader, an open reading frame encoding a trehalose phosphate synthase activity, and downstream of said open reading frame a transcriptional terminator region, preferably wherein said transcriptional terminator region is obtainable from the proteinase inhibitor-II gene of *Solanum tuberosum*.

17. A plant derived and plant expressible gene encoding a bipartite trehalose synthesizing enzyme.

18. A vector comprising a chimaeric plant expressible gene according to claim 16 ~~or 17~~.

19. A recombinant plant genome comprising a chimaeric gene according to claim 18.

20. A plant cell having a recombinant genome according to claim 18.

21. A plant or a part thereof, consisting essentially of cells according to claim 20, preferably a plant from the species *Solanum tuberosum*.

22. A plant part according to claim 21, which is a tuber or a micro-tuber.

23. A process for obtaining trehalose, comprising the steps of growing plant cells according to claim 20, or cultivating a plant according to claim 21, or cultivating a plant part according to any one of claims 21 or 22, extracting trehalose from said plant cells, plants or parts.

24. A process for obtaining trehalose, comprising the steps of producing trehalose in plant cells, a plant or a part thereof, according to a process of ~~any one of claims~~ 1 ~~to 9~~, and separating or extracting trehalose from said plant cells, plant or part thereof.